ENVIRONMENTAL ASSESSMENT

YAMHILL WATERSHED ROAD STABILIZATION AND WATERSHED RESTORATION PROJECT
EA number OR-086-01-05

August 3, 2001
USDI - Bureau of Land Management
Oregon State Office
Salem District
Tillamook Resource Area
Tillamook and Yamhill Counties, Oregon

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CONTENTS

LIST OF APPENDICES

LIST OF FIGURES

LIST OF TABLES

1.0 PROJECT SCOPE

For the reader's convenience, terms defined in the Glossary (chapter 6.0) are shown in ***bold italics*** the first time they appear within the text of this Environmental Assessment.

1.1 Project Location

The project area is located in Yamhill County, Oregon in the general area between Willamina and McMinnville, Oregon. The project area includes all selected roads controlled by the Tillamook Resource Area, Salem District, BLM (Bureau of Land Management) within the Yamhill River watershed (Figure 1).

The project area is within the Riparian Reserve, Adaptive Management Area (AMA), and/or Late-Successional Reserve (LSR) land use allocations as identified in the Salem District Record of Decision and Resource Management Plan, dated May 1995. The project area also falls within the ***Evolutionarily Significant Units*** (distinct population segments) of Upper Willamette River steelhead and Upper Willamette River chinook salmon, which are Federally listed as Threatened.

Portions of the project area are located within designated critical habitat for the marbled murrelet, northern spotted owl, and Upper Willamette River steelhead and Upper Willamette chinook salmon.

INSERT FIGURE 1 HERE

1.2 Background

In the spring of 2001, BLM staff specialists representing silviculture, soils, hydrology, wildlife, fisheries, timber, botany, engineering, recreation, and cultural resources, reviewed existing data on Tillamook Resource Area-controlled roads within the Yamhill River watershed to: (1) identify road and road-related resource conditions that did not meet the management objectives contained in the Salem Resource Management Plan (RMP), the *Northern Coast Range Adaptive Management Area Guide*, dated January 1997, the *Late-Successional Reserve Assessment for Oregon's Northern Coast Range Adaptive Management Area (LSRA)*, dated January, 1998, and the *Western Oregon Districts Transportation Management Plan (TMP)*, dated June, 1996, and (2) develop possible management actions that would contribute to the achievement of some of the long-term management direction.

On May 16, 2001, the Tillamook Field Manager selected from the list of possible management actions those actions, hereafter referred to as the proposed action, described in section 1.4. The Field Manager also directed an ***interdisciplinary team (IDT)*** to conduct an ***environmental analysis*** of the proposed action in accordance with the ***National Environmental Policy Act (NEPA)***. That environmental analysis is documented within this environmental assessment (EA).

This EA is intended to provide the Tillamook Field Manager sufficient information for reaching an informed decision and determining whether an action may have significant environmental effects. Should the selected action(s) have significant environmental effects, an ***Environmental Impact Statement*** will be prepared. If the selected action(s) do not have significant environmental effects, a ***Finding Of No Significant Impact*** (FONSI) will be prepared.

1.3 Purpose and Need for Action

In recent years, the BLM has not been able to adequately maintain all of the road system that it controls, which includes roads on BLM lands and easements and rights-of-way on other ownerships. Reductions in timber harvest levels have resulted in reduced BLM funding for road maintenance, and the subsequent concentration of road maintenance activities on main travel routes and other roads that are required to fulfill legal access to other land owners. Funding for road maintenance over the next 10 years is anticipated to be similar to current levels, which would only allow for regular maintenance of approximately 100 miles of road on the Tillamook Resource Area. It is therefore necessary to identify those roads that would not be maintained, and to stabilize or decommission them to reduce the potential for adverse impacts to other resources resulting from road failures.

The desired condition is one in which all Tillamook Resource Area-controlled roads in the Yamhill River watershed are either regularly maintained or stabilized and/or decommissioned so that they no longer need regular maintenance and are not having an adverse impact on water quality, fisheries, or other resources.

1.3.1 Project Objectives

By comparing existing resource conditions to desired resource conditions and the management objectives contained in the RMP, TMP, and LSRA, the IDT identified several management opportunities. The following objectives were developed to address those opportunities:

1. Identify BLM-controlled roads that would not be required for access by BLM or neighboring landowners in the next 10 or more years. Identify treatments for these roads that would substantially reduce or eliminate maintenance needs until the roads are again needed for access (RMP page 64);
2. Rehabilitate and protect at-risk fish stocks and their habitat (RMP page 27);
3. Accomplish ***Aquatic Conservation Strategy*** (***ACS***) objectives (RMP pages 5-6);
4. Maintain roads at a level appropriate to the assigned ***Transportation Management Objective (TMO)*** (TMP page 19).

The proposed action (section 1.4) was specifically designed to achieve the objectives listed above.

1.4 Proposed Action

The proposed action would stabilize or decommission approximately 70 miles of BLM controlled roads over a five to ten year time period, beginning as early as 2002. The roads are all within the Yamhill River watershed.

1.5 Decisions to be Made

Dana Shuford, Tillamook Field Manager, is the official responsible for deciding whether or not to prepare an ***environmental impact statement***, and whether to approve the road stabilization and watershed restoration project, and the storm-damage road repair project as proposed, not at all, or to some other extent.

1.6 Issues and Units of Measure

In compliance with NEPA, a letter and scoping report (Project Record document 3) were mailed on May 17, 2001 to 38 potentially affected and/or interested individuals, groups, and agencies (Project Record document 2). A total of one letter was received as a result of this scoping effort, which was assigned a number and filed within the Project Record (Project Record document 6). The IDT reviewed, clarified, and assessed the public comments. The disposition of those comments is contained in Appendix 1.

Considering public comment, the IDT did not identify any ***major issues***. Chapter 3 will contain a discussion of the standard elements of the environment (i.e., soil and water, vegetation, wildlife, fisheries and recreation) which were not identified as major issues but are subject to environmental analysis. Additionally, the standard elements of the environment are associated with a specific ***unit of measure***. The units of measure were selected to evaluate attainment of project objectives and/or describe environmental impacts.

1.6.1 Soil and Water

The units of measure selected for soil and water resources include: number of drainage structures removed, and narrative of the effects of an action on soil productivity, water quality, and hydrology.

1.6.2 Vegetation

The unit of measure for special status species is whether an action would contribute to the need to elevate the level of concern for a species or result in loss of population viability. The unit of measure for noxious weeds is a narrative.

1.6.3 Wildlife

The unit of measure selected for each wildlife species listed or proposed under the Endangered Species Act (ESA) is a narrative that describes whether or not there would be: (a) no effect, (b) may affect, beneficial, (c) may affect, is not likely to adversely affect, or (d) may affect, is likely to adversely affect. The unit of measure selected for designated Critical Habitat for wildlife species listed under the ESA is a narrative that describes whether or not there would be "no effect" or "may affect". The unit of measure selected for wildlife species included in the Special Status Species policy covered under BLM Manual 6840 is a narrative that describes whether or not there would be a trend toward federal listing, loss of population viability, or contribute to the need to elevate the level of concern. The unit of measure selected for other wildlife species of concern is a narrative.

1.6.4 Fisheries

The unit of measure selected for fish species listed or proposed under the ESA and designated Critical Habitat is a narrative that describes whether or not there would be: (a) no effect, (b) may affect, is not likely to adversely affect, or (c) may affect, is likely to adversely affect. The unit of measure for Essential Fish Habitat (EFH) as described in the Magnuson-Stevens Act is a narrative that describes whether or not there would be an adverse effects or not. An additional unit of measure is consistency with ACS objectives. The unit of measure selected for fish species included in the Special Status Species policy covered under BLM Manual 6840 is a narrative that describes whether or not there would be a trend toward federal listing or loss of population viability.

1.6.5 Recreation

The unit of measure is a narrative that describes whether or not there would be an effect on recreational access and experience.

2.0 ALTERNATIVES

2.1 Alternative Development

There were no major issues raised by the public during scoping for the actions addressed in this EA, therefore the only alternative to the Proposed Action is the "no action" alternative.

2.2 Alternatives Considered in Detail

2.2.1 Alternative 1 (The No Action Alternative)

The No Action alternative would serve to set the environmental baseline for comparing effects of the action alternative.

For this EA the no action alternative is defined as not implementing any of the proposed road stabilization treatments in these watersheds. There would be no sidecast removal, waterbar construction, road blocking, or road decommissioning at this time on the roads proposed for treatment under Alternative 2. These roads would receive little or no maintenance in the future, and would soon become blocked with debris or overgrown with brush. Some of these roads may be re-opened in the future as funds become available, but it is anticipated that most of the roads would remain closed until they are needed for management activities. Culverts, cross-drains and ditches would become partly or fully blocked with debris and would either not function at all or function at a reduced level. The end result would be that during winter storms many of these structures would fail and there would be road damage ranging from ditch and road surface erosion to complete road fill failures (landslides). Many of these culverts and cross-drains are 30 – 40 years old, are badly corroded and decomposing, and would fail if they are not replaced soon.

2.2.2 Alternative 2 (The Proposed Action)

This alternative would stabilize or decommission approximately 70 miles of BLM controlled roads over a five to ten year time period, beginning as early as the fall of 2001 (Figure 2). The roads are all within the North Yamhill and Lower South Yamhill River and Willamina Creek 5th-field watersheds. The different treatments and the length of road that would be treated are as follows:

(note: Treatments 1A and 2A are considered normal road-maintenance activities and are therefore not included with this project. They are included here for information only.)

Treatment 1A. Maintain the road by regular maintenance of the surface, replacing undersized or rusted-out culverts, and cutting brush alongside the road. The total length of road in this category would be approximately 81 miles.

Treatment 2A. Stabilize the road and allow brush to grow and close the road to vehicle travel in time. The road would be prepared to avoid future maintenance needs and would be left in an "erosion-resistant" condition by establishing driveable waterbars on *the roadway. The total length of road in this category would be approximately 42 miles.*

Treatment 3B. Close the road to all vehicular use. The road would be prepared to avoid future maintenance needs and would be left in an “erosion-resistant” condition by establishing non-driveable waterbars, removing sidecast material where appropriate, pulling live-stream culverts, and constructing earth barricades to block the road. The total length of road to be treated would be approximately 69 miles.

Treatment 4A. Close the road to all vehicular use. The road would be prepared to avoid future maintenance needs and would be left in an “erosion-resistant” condition by decommissioning the road by removing all culverts and road fill over culverts, removing sidecast material where appropriate, constructing earth barricades to block the road, and subsoiling and revegetating the road surface. The total length of road to be treated would be approximately one (1) mile.

2.2.2.1 Design Features:

The following design features apply to the road stabilization and watershed restoration project.

1. All soil-disturbing work would be conducted during periods of low soil moisture, which is generally between July 1 and October 15.

INSERT FIGURE 2 HERE

2. All of the work associated with treatments 3B and 4A would occur with the road prism, which includes the road surface, cut and fill slopes, and sidecast areas. All waste disposal would be on existing roads or existing waste disposal sites.

3. In-stream work would be done in accordance with Oregon Department of Fish and Wildlife (ODFW) guidelines. The work period, unless waived by ODFW, would be between July 1 and October 15.

4. Within the nesting period for the marbled murrelet (between April 1 and September 15), activities that generate noise above the ambient noise level would be restricted to the daily time period between two hours after sunrise to two hours before sunset.

5. Waste material from road fill removal over culverts and sidecast pullback would be disposed of in approved, stable waste disposal sites, in locations at least 60 feet away from streams and wetlands, where there is minimal potential for erosion or mass wasting to occur. In general, this would be on roadbeds, against cut banks, or on landings close to the location where the waste material is being removed. No waste would be disposed of on active flood plains. It is anticipated that most of the waste disposal sites would be within one-quarter (1/4) mile of the locations where the waste is being generated.

6. Piled road-fill material would be used to block roads to high-clearance and/or highway vehicles, where appropriate.

7. Surveys for noxious weeds would be conducted prior to soil-disturbing activities. Site-specific measures would be identified to prevent the spread of noxious weeds.

8. Sediment movement from disturbed areas would be controlled with vegetated filter strips or structures such as straw bales. Structures would be placed to minimize the potential for diversion of water and sediment around the structures.

9. Exposed soils in areas such as disturbed cut and fill slopes, and culvert removal and waste disposal areas would be seeded with either a native, non sod-forming type grass seed mix, if available, or a sterile annual grass seed to reduce the potential for soil erosion.

10. Excavations to remove stream crossing culverts would be matched to the approximate elevation and bank-full stream channel width of the existing streambed.

11. Waterbars would be placed on both sides of stream channels where culverts have been removed to route surface water away from newly excavated slopes.

12. Waterbars would be located where drainage would be diverted away from unstable terrain (e.g., steep slopes or sidecast material), exposed mineral soil or into stream channels.

13. The highest priority areas for sidecast material removal are areas adjacent to streams where sidecast failures would enter the streams.

14. Additional design features would be determined on a site-by-site basis to ensure that the Best Management Practices (BMPs) identified in the Salem RMP are incorporated into the project.

15. Cultural resource surveys would be conducted prior to any new ground-disturbing activity. If cultural resources are found, the project may be redesigned to protect the cultural resource values present or evaluation and mitigation procedures would be implemented based on the recommendation of the District Archaeologist.

16. If, during project implementation, it is determined that an individual project site would result in potential impacts to suitable red tree vole or survey and manage mollusk habitat, surveys would be conducted according to protocol and any newly discovered sites would be managed in accordance with Bureau policy.

3.0 AFFECTED ENVIRONMENT and ENVIRONMENTAL CONSEQUENCES

3.1 Introduction

This Chapter shows the present condition (i.e., affected environment) within the project area and the changes that can be expected from implementing the action alternative or taking no action at this time. The "no action" alternative sets the environmental baseline for comparing effects of the action alternative.

The environmental effects (changes from present baseline condition) that are described in this chapter reflect the elements of the environment (soil and water, vegetation, wildlife, fisheries and recreation). For those other resources or values for which review is required by statute, regulation, Executive Order, or policy, Appendix 3 contains the appropriate documentation as to the effects of the proposed action on those resources or values. Appendix 4 contains a description of past, present, and reasonably foreseeable future actions that will be considered in the cumulative effects discussion in this chapter.

For a full discussion of the physical, biological, and social resources of the Salem District, refer to the FEIS (Final Environmental Impact Statement), dated September, 1994, for the Salem District Resource Management Plan. The discussion in this EA is site-specific and supplements the discussion in the Salem District FEIS.

3.2 Soil and Water

3.2.1 Affected Environment

3.2.1.1 Soils

The topography of the region is characterized by narrow, nearly level valley pastures and meadows surrounded by steep, forested hills and low mountains. The surface rocks are commonly of marine sedimentary or volcanic origin and are frequently weak and highly sheared. Much of the terrain is steep and rugged, and the annual rainfall is very high. The combination of these factors results in high natural erosion rates. As is typical in the Coast Range, erosion is dominated by mass wasting processes. Debris slides on steep slopes (>70%) covered by shallow soils are the most common type of mass movement. Other mass movement processes present are deep-seated slump/earthflows, debris flows, debris torrents, soil creep, and rockfalls. Landslides are most likely to occur after major winter storms and long periods of rainfall. Known areas of instability in the project area include Baker Creek and Panther Creek.

Soils developed from the volcanic rocks commonly are 30 to 50 inches thick and have loam and silt loam textures. Soils developed from sedimentary rocks commonly are more than 60 inches deep and frequently weather into silty clays. These soils in general have relatively high levels of silt, ash and organic matter and tend to be non-cohesive and are moist most of the year. Normally these soils have high capacity to absorb and move water through their profiles, but when disturbed, compacted, and stripped of vegetative cover they become highly vulnerable to surface erosion, especially on long, continuous and steep slopes.

3.2.1.2 Water

Climate and Hydrology

The project area is situated on the eastern flank of the Oregon Coast Range. Elevations range from about 400 to 3,100 feet above mean sea level, a majority of the project roads are above . Average precipitation ranges from about 80 inches to more than 140 inches a year, about three- fourths of it falling between October and March.

The project area covers a large geographic area, falling within three 5th-field watersheds: the North Yamhill and Lower South Yamhill River, and Willamina Creek. In total, they cover about 380 square miles. Most of the forest roads proposed for treatment are located in the middle and upper portions of North Yamhill and Willamina Creek watersheds. Less than five percent of the total roads are within the South Yamhill River watershed. Watershed analyses have been completed for the North Yamhill River (1997) and the Willamina Creek and Lower South Yamhill River (1998) watersheds. Watershed assessments have been completed for the North Yamhill (2001), Lower South Yamhill-Deer Creek (2000), and Willamina (1999) watersheds. These completed documents contain detailed descriptions of the existing conditions (reflective of past and present actions) and reference conditions relevant to the proposed action for those watersheds.

The hydrology is typical of the north Oregon Coast. Water flow is dominated by direct storm runoff, little from base flow. Flows are highest from December through April and lowest in July through October. Drainage patterns are mainly dendritic. Streams near project roads are primarily high gradient, low-order (1st to 3rd order) with their channels confined to narrow canyons. Many of the headwater channels have been scoured to bedrock. Larger ordered (4th and 5th order) streams are generally low gradient (<4%) in unconfined channels. Land management activities (such as road building, logging, damming, and channel cleaning) have modified the physical character of many of the streams in these watersheds. The watersheds have high road density, ranging from 2.9 to 4.8 mi/mi² (Table 1). A road density greater than 2 mi/mi² is considered an indicative of possible elevated sediment delivery. Some of the project roads are directly encroaching flood plains. Stream channels often lack large logs and woody debris and other important structural elements, contributing to simplified habitats. Simplified stream channels lack the ability to retain adequate levels of high quality spawning gravels, fine organic matter, and pools and cover. Riparian zones are commonly dominated by red alder, bigleaf maple, and various brush species and are generally lacking in large conifers for future large woody debris recruitment. For a discussion on the past, present, and reasonably foreseeable future actions including the total number of water rights within the affected watersheds see Appendix 4.

Table 1. Size of Watersheds, Road Density, and Miles of Roads

Watershed	Area (mi^2)	Road Density (mi/mi^2)	Miles of Road
North Yamhill River	177	4.5	799
Lower South Yamhill River	119	2.9	341
Willamina Creek	84	4.8	399
Total	382	4.0	1,539

Beneficial Uses and Water Quality

The beneficial uses of water in the Willamette Basin are listed in the Oregon Administrative Rules (OAR 340-41-442). The major beneficial uses of water in the project area include domestic and municipal consumption, cold water fisheries (including anadromous fishes), esthetic, recreation, irrigation, industrial/manufacturing, livestock watering, power, and wildlife. In general, the most sensitive of these uses is for domestic and community drinking water and habitat for rearing and spawning salmonids.

All three watersheds have anadromous salmonid populations. Some roads cross stream channels with anadromous salmonid habitats. There are 24 municipal water right permits including three reservoirs - Haskins Reservoir (City of McMinnville) on Haskins Creek RM 3.75, Carlton Reservoir (City of Carlton) on Panther Creek, and Turner Creek Reservoir (City of Yamhill) on Turner Creek approximately RM 4. The City of Willamina has a number of municipal water rights on the upper Willamina Creek. The nearest known municipal rights are located in the upper Willamina Creek drainage near Stony Mountain. The nearest known municipal water right with a stream or reservoir water source is about 400 feet from a BLM road in T.4S., R.6W., S.5. The next closest one is located upslope of the project road or at least 900 feet away. Most water rights for domestic, irrigation and livestock are located several miles downstream from the project area in valleys. The nearest domestic water right with a stream source to a project road is located approximately 100 feet downslope of the Rex Brown Road near Fall Creek in the North Yamhill watershed. The next closest domestic water right with a stream source is either located upslope of the project road or at least 2,000 feet away.

The Oregon Department of Environmental Quality (DEQ) is required to maintain a list of water bodies within the state that do not meet the state's water quality standards. Several streams segments within the project area were identified in the DEQ *1998 303(d) List of Water Quality Limited Streams*. Table 2 describes the basic information for their listing. DEQ also maintains a list of water bodies which there are water quality concerns but available data is lacking. Water bodies of concern are listed in Table 3.

Table 2. Listed Water Quality Limited Stream Segments

Stream Segment	**Parameter**	**Comments**
Yamhill River, North		
Mouth to Turner Creek	Bacteria Flow Modification Temperature	Water contact recreation, (fecal coliform-96 Std)- Year around Low flows High temperatures (Rearing 64F) Summer
Turner Creek to headwaters	Temperature	High temperatures (Rearing 64F)- Summer
Yamhill River, South		
Deer Creek, mouth to headwaters	Bacteria	Water contact recreation, (fecal coliform-96 Std)- Year around
Deer Creek, mouth to Little Deer Creek	Temperature	High temperatures (Rearing 64F)- Summer
Willamina Creek, mouth to headwaters	Bacteria	Water contact recreation, (fecal coliform-96 Std)- Summer

Table 3. Water Bodies of Concern

Stream Segment	Parameter
Yamhill River, North	
Haskins Creek, mouth to headwaters	Sediment, Flow Modification, Temperature
Hawn Creek, mouth to headwaters	Toxics, Sediment, Nutrients, Bacteria, Flow Modification, DO, Temperature
Panther Creek, mouth to headwaters	Bacteria, Sediment
Turner Creek to headwaters	Sediment, Flow Modification
Yamhill River, South	
Deer Creek, mouth to headwaters	Flow modification, Sediment
Willamina Creek to headwaters	Bacteria

Roads

There are about 70 miles of forest roads proposed for treatment. Many of the stream crossings and road segments show signs of instability and deterioration and if not repaired or stabilized have the potential to deliver substantial amounts of sediment into the streams below. A number of drainage structures failed during the large winter storms between 1995 and 1999. Most of the work, with the exception of a few areas of sidecast material, would be done in the existing road prism areas.

Most roads are lightly traveled, rocked, and insloped with vegetated ditches. These roads were constructed for forest management purposes to gain access to timber stands for harvest and forest operations. Almost all of the roads were constructed in the early 1960s to the late 1980s; the majority of them in the past 20 to 30 years.

Older roads are generally more prone to failure than newer roads. Road related failures (e.g., sidecast, fill, base or loading, cutslope failures) and landslides are becoming increasingly common on these older roads. When the project roads were built 20 to 40 years ago, less was understood about their engineering and potential resource impacts. They were constructed under less stringent standards and guidelines than today. Prior to the early 1980s, drainage structures were designed to move water and sediment off the roadway as quickly and efficiently as possible. That often meant moving water and sediment, directly into stream channels rather than filtering the road sediment through the forest floor. End-haul construction was not commonly practiced on steep terrain. Thick fills were often place on top of culverts across swales and drainage crossings, increasing the risk to resources.

Many roads were built on poor locations, often on steep, mid-slope, high risk terrain. Approximately two-thirds of the project roads are on mid-slope positions, and about one-third are located on ridgetops. Few, if any, are on valley positions. Mid-slope roads tend to have more erosional and hydrological impacts. They frequently cut cross streams and steep, unstable hillslopes. The 1996 BLM Salem District Flood Assessment found that over 90% of all the failed culverts surveyed in the District were on mid-slope roads. Most of the road damage commonly associated with landsliding and debris flows occurred in the upper third of the sideslope.

Many of the roads have aged, corroding and failing metal culverts. A few of them have log culverts. The design life for minor road drainage structures is typically 20 years. Many of the culverts in the project area are 20 to 30 years old. Many of the culverts were designed to the flow that would be expected during a 50-year storm event. New Northwest Forest Plan Standards and Guides require that drainage structures be designed for a 100-year storm and be large enough to allow passage of bedload and debris.

Tillamook Resource Area has recently completed a Road and Culvert Inventory on the project area. The field data, containing hundreds of entries, have not yet been fully entered into a computer database, and so there is no way to query that data to determine the exact number of channel culverts. The proposed treatments to stabilize or decommission the BLM-controlled roads would be the same as the nearby Coastal Road Stabilization and Watershed Restoration, and Storm-Damage Road Repair Projects. And the project site conditions and road conditions appear to quite similar to those found in the above projects. Assuming conditions are similar, the proposed action would result in the removal of roughly 200 channel culverts. Furthermore, approximately 69% of the culverts that been surveyed are in fair or poor condition. While the culvert spacing often exceeds spacing recommendations, only a minor amount of ditch erosion is evident. Well-vegetated ditches appear to contribute to the lack of ditch erosion.

Road Erosion and Sediment Delivery

Road erosion can produce excessive sediment loads thereby increasing turbidity levels, filling gravel beds, and changing channel habitats by reducing pool frequency, depth and volume. There are three main types of erosion on forest roads - surface erosion, washouts, and mass erosion. Road surface erosion tends to be chronic and widespread and produces fine sediment most likely to affect turbidity. Effects are usually long-term and can extend long distances downstream. Washouts and mass erosion (landslides) tend to be episodic and site specific. They affect bedload and channel morphology, effects are usually short-term and diminish downstream.

The most common approach used to estimate the amount of sediment that roads are contributing by surface erosion is to multiply sediment from each road segment by a fractional delivery. In a study on the central Coast (Black, 1997), researchers found that the average erosion rate for a lightly used forest road was 1.77 tons per mile (1 kg/m). The study was in a watershed with rocks, soils and roads generally similar to the project area. In another study (Duncan, 1987) in western Oregon and Washington, researchers found that 20% of road surface sediment was transported onto the forest floor and 80% was delivered to streams. Similar erosion rates and sediment routing conditions are expected to be present in the project area. Using this information, estimates of existing surface erosion and sediment delivery from the proposed stabilization project roads for an average year are presented in Table 4. Caution should be exercised in using these estimates. Site specific data (e.g., climate, road slope, segment length, soil texture, buffer distance and grade) was not utilized in the estimate. There is large temporal and spatial variability in sediment yields on landscapes.

Road washouts and road related landslides probably deliver considerably more sediment to stream channels than road surface erosion, especially after major disturbance events such as extreme storms and wildfires. Channel culverts commonly result in large amounts of sediment being delivered into streams. In a Salem District 1996 Flood Assessment, BLM found that the average channel culvert failure delivered 1,000 cubic yards of road prism material. The total amount of sediment produced by these processes from the project roads is unknown. A partial sediment budget (not including soil creep, bank erosion and effects of fire and earthquakes) was developed for the Kilchis watershed (Mills, 1997). In the study it was estimated that washouts contributed more sediment than road surface erosion by a factor of 50 for major storms (5-10 year events) and by a factor of 500 for extreme storms (50 year events). Road landslides increased sediment by a factor of 400 and 4,000 respectively. The Kilchis watershed has more older roads, steeper, unstable hillslopes, and more area burned by wildfires than the watersheds found in the project area. It is therefore likely that there are proportionally fewer road washouts and road landslides in the project area.

Table 4. Estimated Surface Erosion and Sediment Delivery Currently Occurring on Project Roads

Watershed	Miles of Roads to be Treated	Estimated Existing Surface Erosion (tons/yr)	Estimated Sediment Delivery (tons/yr)
North Yamhill River	26	46	37
Lower South Yamhill River	2	4	3
Willamina Creek	42	74	59
Total	70	124	99

3.2.2 Environmental Consequences

3.2.2.1 Soil

3.2.2.1.1 Alternative 1 (No Action)

There would be minimal effect on soil productivity in the project area from the No Action alternative. The only new soil disturbance would be in those areas where there are road failures that affect soils downslope from the failures. Any soil that is contained in sidecast that fails has already been disturbed and has lost productivity as a result of that disturbance, therefore there would be little change in productivity on the sidecast material itself. The soils downslope from the sidecast failures would be impacted on those sites that experience sidecast failure. The amount of new soil disturbance is estimated to average less than 0.5 acre/year on all the roads proposed for stabilization.

3.2.2.1.2 Alternative 2 (Proposed Action)

The effects of this alternative on soil productivity in the affected watersheds would be similar in magnitude to the effects under the No Action alternative. There would be a decrease in the likelihood of soil disturbance resulting from road failures because this alternative would reduce the probability of those failures occurring. There would be a small amount of previously undisturbed soil that would be affected by waste disposal from sidecast pullback and road fill removal treatments, but the area disturbed would be very small (less than one acre total) as nearly all of the waste disposal areas would be on existing roadbeds and landings (see Design Feature 4, Section 2.2.2.3).

Cumulative Effects to Soils

No cumulative effects are anticipated from the Proposed Action (Alternative 2) because of the limited amount of new soil disturbance that would occur and the reduction in future soil disturbance from road failures on the roads that are stabilized or decommissioned.

3.2.2.2 Water

It is unlikely that either of the alternatives would have any measurable effects on the existing hydrologic conditions (e.g., peak flows, annual yields, change in flow timing or size) in any watershed. Most of the proposed treatment measures are aimed to stabilize roads, not to rehabilitate them. Only about one (1) mile of road would be decommissioned by removing all culverts, road fill over culverts, and sidecast material where appropriate and subsoiled (Treatment 4A). Considering the type and size of proposed treatment, the routing of water within any of the watersheds is not expected to be substantially changed from any of the alternatives. Channel adjustments under this proposal are expected to be negligible. The proposed actions are unlikely to affect water temperatures. Only a small amount of vegetation would be removed, constituting a very small portion of the stream side influence zone and direct shade off the streams. The primary water quality concern from road effects is sediment delivery and turbidity.

3.2.2.2.1 Alternative 1 (No Action)

This alternative would result in not implementing any of the proposed road stabilization treatments in these watersheds. There would be no maintenance in the near future, and these roads would soon become blocked with debris and/or overgrown with brush. Culverts, cross-drains and ditches would become partly or fully blocked with debris and would either not function at all or function at a reduced level. Road surfaces would continue to deteriorate, with a corresponding increase in sediment from surface erosion. A majority of the culverts in these roads are older than their 20-year design life and are deteriorating to the point that they will fail to carry water in the next few years. The end result would be that during winter storms many of these structures would fail and there would be road damage ranging from ditch and road surface erosion to complete road fill failures (landslides).

Three important management practices that can directly affect the quantity of fine sediment generated from roads are 1) the amount of traffic, 2) road maintenance, and 3) spacing between drainage structures.

1) Traffic. Reid and Dunne (1984) found that sediment production on forest roads in western Washington decreased by 745% by reducing traffic from light use to no use. Under this alternative, there would be no change in traffic-generated sediment from the current condition on the 70 miles of road that would be waterbarred and closed to traffic under Alternative 2 (Treatments 3B and 4A). Total sediment production from these roads would likely remain near the current estimate of 124 tons (Table 4) in the future, as reductions in sediment from lighter traffic loads would be offset by increases in surface erosion from water concentrating on roads that are not maintained.

2) Road maintenance. Lack of road maintenance (primarily grading) has increased the erosion and rutting of road surfaces. Under this alternative the roads that are proposed for treatment under Alternative 2 would be more likely to experience increased sediment delivery during large storms due to increased road surface erosion and plugging or deterioration of drainage structures. It is expected that road surface erosion, rutting and failure of drainage structures would increase on these roads over time, with a corresponding increase in the amount of sediment delivery.

3) Spacing between drainage structures. This alternative is expected to lead to an increase in the distance between drainage structures as some culverts become obstructed due to lack of maintenance and water is forced to either cross the road or move down to the next open culvert. This would increase the likelihood of road surface and roadside (ditch) erosion, as there would be more water traveling longer distances down and alongside roads, as well as road fill failures where accumulating water saturates unstable fill slopes and causes landsliding.

It is impossible to predict the number of culverts that may fail in the near future, but more than 180 culverts are older than their design life and in poor condition, which increases the risk of failure. On average, if only one of the large culverts should fail it is expected that 1,000 cubic yards of sediment could be generated.

In summary, this alternative would lead to an increase in sediment delivery and turbidity downstream from the project roads as road surface and drainage structure conditions deteriorate over time. Most of the increased sediment and turbidity levels would occur during winter storm events when background levels are already elevated, but some of the increases would occur during lower streamflow periods when sediment levels are low and the effect on water quality would be greater. The increase in sediment and turbidity would likely be chronic in nature, as the sediment sources would probably not be repaired for some time and the effects on water quality would continue throughout the winter storm season. In the event that any of these road failures are repaired, it would create the potential for additional sediment delivery to the affected streams from the repair activities. This effect would be small and short-term, with most of the impacts occurring during the first major winter storm after the disturbance.

3.2.2.2.2 Alternative 2 (Proposed Action)

This analysis looks at the same three management practices that can directly affect the quantity of fine sediment generated from roads as that for Alternative 1. Those practices are 1) the amount of traffic, 2) road maintenance, and 3) spacing between drainage structures.

1) Traffic. Using the data reported by Reid and Dunne (1984) as described earlier, and applying the 745% reduction to the 70 miles of Treatment 3B and 4A, this alternative would reduce annual sediment delivery on these roads from the current 99 tons/year to about 0.1 tons/year (Table 5).

Table 5. Estimates of Road Surface Erosion and Sediment Delivery after Treatment.

Watershed	Miles of Roads to be Treated	Estimated Annual Surface Erosion after Proposed Treatment (tons/yr)	Estimated Sediment Delivery after Proposed Treatment (tons/yr)
North Yamhill River	26	0.06	0.05
Lower South Yamhill River	2	0.005	0.004
Willamina Creek	42	0.10	0.08
Total TOTALS	70	0.165	0.134

2) Road maintenance. Lack of road maintenance (primarily grading) has increased the erosion and rutting of road surfaces. Without treatment, roads are increasingly likely to fail during large storms due to the plugging or deterioration of drainage structures. Treatments would reduce the severity and potential for washouts and landslides but not eliminate them.

3) Spacing between drainage structures. Establishing waterbars would shorten the distances between drainage structures. This action would reroute surface runoff off the road surface and minimize surface erosion and potential for saturating fills and resulting fill failures. Waterbar effectiveness would depend largely on how well they are installed and traffic.

Road closing, subsoiling and revegetating about one (1) mile of road would increase soil infiltration, decrease erosion and sedimentation in localized areas.

Erosion losses from road stabilization activities are expected to be small and short-term. Project design features (see Section 2.3.2.3) such as by restricting ground disturbing activities to dry periods, working within instream work windows, and disposing of waste in stable areas would reduce the amount of sediment entering streams. Sedimentation created by stabilization activities would be greatest in the first major storm following the disturbance, and would decline quickly as soils stabilize and become vegetated. Sediment increases due to project road construction would be expected to decrease to near background levels within two or three years after disturbances. Based on the local experience of the Siuslaw National Forest, we expect that culvert removal would result in an average of about 2½ cubic yards of sediment from each channel culvert removal. Most of the sediment would be delivered to streams in the first major storm following the disturbance, with sediment returning to background levels with two or three years. Using this estimate, removing 200 channel culverts would result in approximately 500 cubic yards total or about 625 tons of sediment. This amount would be spread over several years and would be less sediment than that produced by a single average large culvert failure.

In summary, the proposed treatments would result in long-term reduction in sediment levels. In the short-term there would some small amount of sediment that is likely to enter streams. However, this amount would be short-term in nature, and transitory and minor compared to what would result without the treatments. These treatments would substantially reduce the amount of sediment delivery into streams, particularly at stream crossings and landslide prone areas. Fine sediment and turbidity from surface erosion would be greatly reduced.

Cumulative Effects (common for both projects)

The anticipated cumulative effects to water quality from the Proposed Action (Alternative 2) would be a short-term increase in sediment and turbidity while the projects listed in Appendix 4 are being implemented because potential adverse effects are small, limited in space, and would be across a large geographic area over a 5 to 10 year time span. This proposal is unlikely to impede and/or prevent attainment of the stream flow and basin hydrology, channel function, or water quality objectives of the Aquatic Conservation Strategy (ACS). Over the long-term, this proposal should aid in meeting ACS objectives by reducing road related runoff and sediment delivery to streams, thus improving water quality. (See also Appendix 6).

3.3 Vegetation

The forest vegetation in the general project area consists of a mosaic of 65- to 100-year old conifer forest and young plantations that are 5- to 15-years old. Understory vegetation is typically sword fern, huckleberry, salmonberry, thimbleberry, vine maple, and associated species. The specific areas that will be treated are within the road prism. These areas are typically vegetated with alder, small conifers, brush species such as salmonberry and thimbleberry, and weedy species. It is anticipated that the vegetation disturbed by these projects would consist of small alder (less than 6 in. diameter), brush and weedy species, and occasionally a small conifer (less than 6 in. diameter). This analysis focuses on the affected environment and environmental consequences related to special status species and noxious weeds.

3.3.1 Special Status Species and Noxious Weeds

Special Status Species are those species requiring special management under the following references: the Endangered Species Act of 1973, BLM Manual 6840 - "Special Status Species Management" and the "Oregon-Washington Special Status Species Policy - Instruction Memorandum No. OR-91-57".

3.3.1.1 Affected Environment

Work will be done entirely within the existing road prism, consisting of surfaced (gravel or asphalt) roadways and sidecast areas. Vegetation within these types of areas is typically dominated by disturbance or early successional plants and often contain weedy species. It is not necessary to conduct surveys for special status species for work done within the road prism.

Surveys for noxious weeds prior to project initiation are included as a design feature.

3.3.1.2 Environmental Consequences

3.3.1.2.1 Alternative 1

No road stabilization or decommissioning would take place under this alternative which would likely result in structure failures in the future. Such failures can cause erosion, potentially as great as landslides, to occur. Erosive events have the potential to affect a much larger area than simply what is contained within the road prism. Downslope habitats, particularly riparian areas, would be in danger of damage or destruction from such events. Special status species located in these areas would face partial or total loss of individuals or habitat.

Disturbed habitats provide optimal colonization habitats for noxious weeds. Lack of road stabilization may lead to periodic disturbances which could allow local weed populations to expand.

3.3.1.2.2 Alternative 2

The proposed action would forestall structure failures and their associated erosion events for the foreseeable future. This would lessen any threats to populations of special status species that may be located downslope of the project areas.

Prevention of habitat disturbances will reduce or eliminate the creation of new habitats for weed encroachment. Design features providing for weed surveys and revegetation of areas disturbed in project work should prevent weed population increases.

3.4 Wildlife

3.4.1 Affected Environment - Wildlife

The proposed projects would occur within the forested landscapes of the North Yamhill River, Lower South Yamhill River, and Willamina Creek watersheds. As a result of fire history and past management practices, forested lands in these watersheds are strongly dominated by early and mid-seral stage habitats; late-seral patches of interior forest habitat are generally lacking. The differing forest types in the project area are not evenly distributed. In some areas forest fragmentation is very high and the area is permeated with high contrast edges; in other areas there are large tracts of relatively uniform young forests yet unfragmented by timber harvest. Most areas contain a dense network of forest roads.

Additional information on the affected environment relative to wildlife resources can be located within the RMP, the *North Yamhill Watershed Analysis*, BLM, dated January 1997 and the *Deer Creek, Panther Creek, Willamina Creek and South Yamhill Watershed Analysis*, BLM, dated May 1998. See Appendix 2 for a list of wildlife species of concern.

3.4.2 Environmental Consequences - Wildlife

3.4.2.1 Alternative 1

The No Action alternative would not alter the current status of the affected roads and therefore would have no short term effect upon wildlife resources such as disturbance impacts resulting from construction activity. In time, under the no action alternative the affected road surfaces would be expected to become effectively closed to vehicular traffic from brush encroachment, blowdown and road failures. This would result in some longer-term beneficial impacts to wildlife in the form of decreased noise disturbance from traffic noise and increased habitat development. However, under this alternative there is an expectation that some culverts would eventually fail resulting in erosion and an increased potential for landslides. This would have some negative impacts upon downslope habitats including both riparian zones and instream habitats. Species which would be potentially negatively impacted by such failures would include the Columbia torrent salamander as well as Survey and Manage mollusks. In the event of a failure, individual animals located in these areas would most likely be lost however, depending upon the scale of the disturbance, impacts would not be expected to be of such a degree as to threatened the viability of the populations. There would be no direct adverse impacts to wildlife because there would be no actions implemented. As this is a "no action" alternative, no ESA call would be made.

There would be no effect on critical habitats, based upon the fact that no critical habitat elements would be impacted.

3.4.2.2 Alternative 2

Based upon the nature of the proposed action and the habitats impacted, the impacts upon wildlife resources are expected primarily to be very short term and of a minor disturbance in nature. This considers impacts resulting from this alternative as well as those activities identified in Appendix 4. Some longer-term beneficial impacts would be expected to result from the proposal as it reduces the density of open roads within the project area. This would result in a decreased potential for disturbance and long-term increased potential for habitat development on the affected road surfaces. There would be no effect on critical habitats, based upon the fact that no critical habitat elements would be impacted. There would be no cumulative effects to wildlife resources as a result of this alternative or those activities identified in Appendix 4.

See Appendix 2 for a description of the expected impacts of the project upon wildlife species of concern.

3.5 Fisheries

3.5.1 Affected Environment

The proposed project encompasses three 5th-field watersheds, North Yamhill River, Lower South Yamhill River and Willamina Creek. One of the most important components of a watershed restoration program is control and prevention of road-related runoff and sediment production. Roads negatively impact fish and the aquatic ecosystem by elevating erosion rates (chronic surface erosion to landslides), encroaching on flood plains, and creating barriers to fish passage at stream crossings.

Appendix 5, Matrix of Pathways and Indicators, contains discussion of the aquatic system environmental baseline condition for each 5th-field watershed. Generally, all three watersheds have a high road density, ranging from 2.9 miles/mile^2 in the Lower South Yamhill River watershed to 4.8 miles/mile^2 in the Willamina Creek watershed. These estimates are probably low due to unmapped roads. In addition, all the watersheds are very low in large woody debris, which is very important in providing the complex habitat that anadromous salmonids need during the freshwater portion of their life cycle and what resident fish require throughout their life cycle.
Fish species found within the three watersheds are listed in Table 6. Other species may occur within these watersheds for all or part of the year. All fish with federal status under ESA or with Bureau status are included in Table 6.

Table 6. Fish Species found in the North Yamhill, Lower South Yamhill and Willamina Creek Watersheds

Common Name	Scientific Name	Status
Upper Willamette steelhead	*Oncorhynchus mykiss*	federally listed - threatened

Upper Willamette cutthroat trout	*Oncorhynchus clarki*	federal candidate currently considered not warranted for listing
Upper Willamette chinook salmon*	*Oncorhynchus tshawytscha*	federally listed - threatened
Coho salmon	*Oncorhynchus kisutch*	Essential Fish Habitat under the Magnuson-Stevens Act
Pacific lamprey	*Lampetra tridentatus*	Bureau tracking
western brook lamprey	*Lampetra richardsoni*	none
river lamprey**	*Lampetra ayresi*	Bureau tracking
sculpin	*Cottus* sp.	none

* chinook salmon are not known to have historically used these watersheds however introductions were attempted with no known success. BLM Watershed Analysis, 1998.
**presence not verified

3.5.2 Environmental Consequences

3.5.2.1 Alternative 1 (No Action)

Refer to Appendix 5, Matrix of Pathways and Indicators, for additional discussion of the environmental effects of this alternative, including any interrelated or interdependent actions, on relevant indicators. Refer to Appendix 6 for a discussion of this alternative relative to the Aquatic Conservation Strategy Objectives.

There would be no sidecast removal, waterbar construction, road blocking, or road decommissioning at this time on the roads proposed for treatment under the action alternative. There would be no direct adverse impacts to fish because there would be no actions implemented. As this is a "no action" alternative, no ESA call for Threatened or Endangered fis or Essential Fish Habitat (Magnuson-Stevens Act) would be made.

If Alternative 1 was selected the roads would likely fail leading to indirect adverse effects to fish due to habitat loss, increased disturbance and fragmentation of refugia. These roads would receive little or no maintenance in the future, and would soon become blocked with debris or overgrown with brush. Culverts, cross-drains and ditches would become partly or fully blocked with debris and would either not function at all or function at a reduced level. The end result would be that during winter storms many of these structures would fail and there would be road damage ranging from ditch and road surface erosion to complete road fill failures (landslides). Though landslides and debris flows are natural processes, leaving the roads in their current condition is likely to increase the frequency and severity of these processes above the natural level (greater frequency and severity). This could lead to down cutting of higher gradient stream channels and excess substrate delivery/deposition in the lower gradient stream channels. Downcutting may reduce pool habitat, increase bank erosion, and reduced flood plain connectivity. Excessive substrate movement would elevate turbidity, reduce off-channel habitat by filling in alcoves and side channels, and reduce pool habitat through deposition. Landslides may help deliver wood to downstream sites, but also may move the wood farther through the system than would occur naturally or move the wood out of the stream channel and flood plain. Overall there would be a loss of habitat for fish and other aquatic species, increased disturbance within the watershed, and fragmentation of refugia.

Cumulative Effects:

Upper Willamette steelhead and Upper Willamette chinook salmon are both listed as threatened under the ESA and are currently experiencing a downward trend, however chinook salmon are not known to have used the Yamhill River Basin historically or in the recent past. Upper Willamette cutthroat trout are considered not warranted for listing as ESA species, however downward trends for this species are assumed as well. All populations of coho and chinook are covered by the Magnuson-Stevens Act which established new requirements for "Essential Fish Habitat" (EFH). As such, consultation with National Marine Fisheries Service is required for all actions that may adversely affect EFH. Coho salmon are not native to this basin. Their introduction in the 1920s - 1980s was largely unsuccessful, however some naturally reproducing stocks are likely present. Downward trends in populations of anadromous fish including steelhead are attributed to habitat degradation, water diversions, harvest and hatchery influence, and the same is likely to be true of the other salmonids. Quality freshwater habitat for salmonids includes cold water, pools, and clean spawning gravel. The formation of quality habitat depends on an adequate supply of large wood within the stream channel, which creates pools, provides cover and retains spawning gravels. Habitat conditions have changed both as a result of management actions and natural disturbance events. Floods, stream cleaning, slash damming and road construction have impacted stream channels in many locations throughout all the watersheds, resulting in removal of large wood from the stream channel, reduced floodplain connections and downcutting. Fires, homesteading and timber harvest resulted in removal of much of the older timber and thus reduced the potential for recruitment of large wood into the stream channels.

Timber harvest and associated activities are expected to continue on state and private lands. Future management actions on federal lands will be in accordance with the Northwest Forest Plan which contains management direction to maintain or restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems, and to maintain or enhance fisheries potential. Since about 28% of the Willamina Creek watershed is federal land managed by the BLM, actions taken on federal lands to restore riparian and aquatic habitat could have substantive beneficial impacts on fish species within the watershed. The other three watersheds have a much lower percentage of federal ownership than Willamina Creek, so beneficial actions on federal lands would contribute less towards restoration at the watershed scale. Restoration would include actions proposed in this EA (road decommissioning, stabilization and repair). The BLM will likely pursue cooperative efforts with watershed councils, private landowners and others to implement enhancement and restoration activities, which would lead to improvement in aquatic habitat conditions throughout the watershed. In addition, the *Oregon Plan for Salmon and Watersheds* should lead to some improvement in aquatic habitat, though to what extent is unknown as this is largely a volunteer effort. Without pursuing aquatic restoration projects on federal lands, natural recovery of the aquatic ecosystem is expected to occur, though at a much slower pace. A century or more may be required for impacted streams within the watershed to again become properly functioning and provide the quality habitat that at-risk salmonids need to recover. Salmonids currently undergoing a downward trend may not be able to maintain viable populations under the time frame associated with natural recovery of aquatic habitat. Without implementing the actions proposed in this EA, cumulative effects to fish and other aquatic resources are anticipated. Road fills and culverts will continue to fail if not stabilized or decommissioned, which would increase turbidity and sediment in streams.

Impacts to Critical Habitat and Essential Fish Habitat would likely be episodic, with the impacts occurring primarily during winter storm events. These impacts will affect small portions of Critical Habitat and EFH, but are not anticipated to adversely affect all habitats at the same time. The duration of impacts should be short term (less than three years).

3.5.2.2 Alternative 2 (Proposed Action)

Refer to Appendix 5, Matrix of Pathways and Indicators, for additional discussion of the environmental effects of this alternative, including any interrelated or interdependent actions, on relevant indicators. Refer to Appendix 6 for a discussion of this alternative relative to the Aquatic Conservation Strategy Objectives.

Some sediment delivery to streams and increased turbidity could occur if this action was implemented, which could lead to direct and indirect adverse impacts to fish and fish habitat in the short term. Sediment and turbidity could result from sidecast removal, waterbar construction, culvert removal and ripping roads. Increases in turbidity would be short-term, mainly during any actual instream work and possibly following the first major rainstorm after a project has been completed. The main direct adverse impact to fish would be the potential for short-term disruption of normal behavioral patterns (i.e. feeding and sheltering) as a result of increased turbidity. Adverse impacts to fish and fish habitat would be minimized by restricting soil-disturbing work to the period of low soil moisture, limiting instream work to ODFW instream (July1 through October 15) work windows, disposing of waste in stable locations away from streams and floodplains, controlling sediment movement with vegetated filter strips or structures such as straw bales, and seeding disturbed areas with native or sterile grass seed.

Due to the chance for short-term impacts that may result in ***take*** of Upper Willamette steelhead, the ESA call would be “May Affect, Likely to Adversely Affect”. Due to the short term impacts to water quality, the call for Upper Willamette steelhead designated critical habitat would be “May Affect, Likely to Adversely Affect”, however the overall impact to critical habitat would be beneficial. Over the long-term, stabilizing and decommissioning roads is expected to reduce turbidity within the watershed by minimizing or eliminating impacts (erosion and landslides) from the roads identified for treatment.

The call for Upper Willamette chinook salmon, listed as threatened, would be “No Effect”as there is no current or historic use of this watershed by chinook, however as it is Designated Critical Habitat the affect call is “Not Likely to Adversely Affect” due to the distance downstream of habitat that could be utilized by chinook if they were present.

The EFH call for chinook is “Not Likely to Adversely Affect”for this project due to the distance downstream where any probable use by chinook would occur. For the introduced coho populations (some of which are naturally reproducing) the affect call is “ Likely to Adversely Affect” as the proximity to proposed work is closer and culvert removals have the potential of releasing turbid water and sediment which could affect the feeding or growth as well as the substrate to a lessor extent.

Potential adverse impacts would not result in a trend toward federal listing, nor would they lead to any loss in population viability of any other fish species. Beneficial impacts would be expected to result in increased population viability of fish species, including Upper Willamette steelhead and the introduced coho.

<u>Cumulative Effects:</u> Upper Willamette steelhead and Upper Willamette chinook salmon are both listed as threatened under the ESA, are currently experiencing a downward trend, however chinook salmon are not known to have used the Yamhill River Basin historically or in the recent past. Upper Willamette cutthroat trout are considered not warranted for listing as ESA species, however downward trends for this species are assumed as well. All populations of coho and chinook are covered by the Magnuson-Stevens Act which established new requirements for “Essential Fish Habitat” (EFH). As such, consultation with National Marine Fisheries Service is required for all actions that may adversely affect EFH. Downward trends in populations of steelhead are attributed to habitat degradation, water diversions, harvest and hatchery influence, and the same is likely to be true of the other salmonids. Quality freshwater habitat for salmonids includes cold water, pools, and clean spawning gravel. The formation of quality habitat depends on an adequate supply of large wood within the stream channel, which creates pools, provides cover and retains spawning gravels. Habitat conditions have changed both as a result of management actions and natural disturbance events. Floods, stream cleaning and road construction have impacted stream channels in many locations throughout all the watersheds, resulting in removal of large wood from the stream channel, reduced floodplain connections and downcutting. Fires, homesteading and timber harvest resulted in removal of much of the older timber and thus reduced the potential for recruitment of large wood into the stream channels, splash damming in portions of these watersheds over an extended period also changed the stream segments extensively.

Timber harvest and associated activities are expected to continue on state and private lands. Future management actions on federal lands will be in accordance with the Northwest Forest Plan which contains management direction to maintain or restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems, and to maintain or enhance fisheries potential. Since about 28% of the Willamina Creek watershed is federal land managed by the BLM, actions taken on federal lands to restore riparian and aquatic habitat could have substantive beneficial impacts on fish species within the watershed. The other three watersheds have a much lower percentage of federal ownership than Willamina Creek, so beneficial actions on federal lands would contribute less towards restoration at the watershed scale. The BLM will likely pursue cooperative efforts with watershed councils, private landowners and others to implement enhancement and restoration activities, which would lead to improvement in aquatic habitat conditions throughout the watershed. In addition, the *Oregon Plan for Salmon and*

Watersheds should lead to some improvement in aquatic habitat, though to what extent is unknown as this is largely a volunteer effort. Without pursuing aquatic restoration projects on federal lands, natural recovery of the aquatic ecosystem is expected to occur, though at a much slower pace. A century or more may be required for impacted streams within the watershed to again become properly functioning and provide the quality habitat that at-risk salmonids need to recover. Salmonids currently undergoing a downward trend may not be able to maintain viable populations under the time frame associated with natural recovery of aquatic habitat.

The projects described under the proposed action, combined with past and potential future restoration efforts on federal, state and private land, would result in long term, cumulative beneficial effects to fish habitat within the North Yamhill, Lower South Yamhill, Willamina Creek and Upper South Yamhill watersheds. Any adverse impacts to fish and aquatic habitat if the proposed projects were implemented would be short term, therefore no cumulative adverse impacts are anticipated.

3.6 Recreation

3.6.1 Affected Environment

The primary recreational activities occurring within these watersheds on BLM land are hunting, fishing and scenic driving. In recent years, off-highway vehicle (OHV) use has become a popular recreation activity, more so in the North Yamhill and Willamina Creek watersheds than the Lower South Yamhill watershed. The development since 1990 of the Upper Nestucca OHV Trail System, which extends into the upper portion of the Willamina Creek watershed, has been effective in managing OHV activities within that watershed. There are no designated overnight use (camping) areas on BLM lands within these watersheds.

It can be expected that with the increase of population especially along the I-5 corridor, that recreationists will come to these coastal watersheds to satisfy their recreation needs (use is anticipated to increase no more than 1% per year). Most recreational activities have seen growth but some are limited more by the lack of facilities such as campgrounds and increasing restrictions on hunting and fishing. There will be increasing demands placed upon existing recreation facilities and pressure to provide more recreational opportunities in the future.

3.6.2 Environmental Consequences

3.6.2.1 Alternative 1 (No Action)

This alternative will in general reduce the accessibility, particularly for people with mobility handicaps, to public lands in all affected watersheds for recreational activities as roads fail and hence close themselves over time. The quality of recreational experience will be improved for those who prefer more solitude and diminished for others who prefer easier access over a larger area. Some activities, such as retrieval of animals from a successful hunt, will require considerably more effort, unless the closed roads are open to OHV use. Other activities such as hiking or bird-watching may be enhanced by the reduced density of roads.

3.6.2.2 Alternative 2 (Proposed Action)

The impacts of this alternative on recreation will be similar in scope and magnitude to those for Alternative 1. The roads that are intentionally closed in this alternative may not be the same as those that are allowed to close on their own under Alternative 1, so the impacts to motorized recreational access may occur in different areas and sooner than would occur under Alternative 1. No approved OHV trails would be affected by this alternative.

3.7 Conformance With Land Use Plans, Policies, and Programs

ernative 1 (no action), and Alternative 2 (the proposed action), unless otherwise noted, are in conformance with the following documents which provide the legal framework, standards, and guidelines for management of BLM lands in the Tillamook Resource Area:

Salem District Record of Decision and Resource Management Plan, May 1995, pages 5-6 (ACS Objectives), 6-7, 9, 11-12 (Riparian Reserves), 22-24 (Water and Soil), 27 (Fish Habitat), 28 (Special Status & SEIS Special Attention Species and Habitat), 62-64 (Roads) and Appendix C (Best Management Practices).

- ACS Objectives and Riparian Reserves Objectives: Alternative 2, the proposed action, is predicted to result in the maintenance and/or restoration of ACS objectives (Appendix 6). Alternative 1 (No Action) could at some point in the future retard the attainment of most of the ACS objectives due to the fact that road surfaces and drainage structures would not be maintained and would contribute increasing amounts of sediment from erosion and road fill failures. Alternative 2, the proposed action, would decrease the amount of road fill failures and surface erosion, which would result in the maintenance and/or restoration of ACS objectives.

- Water and Soils Objectives: Applicable Best Management Practices as described in the RMP, (Appendix C) are incorporated into the project design for the proposed action and assure the maintenance of water quality and reduce the impacts to soil productivity while meeting other resource management objectives (Section 2.2.2.1). Alternative 1 (No Action) would result in an increase in road failures and associated water quality and soil productivity impacts.

- Fish Habitat: Alternative 2 promotes the rehabilitation of at-risk fish stocks and their habitat (Section 3.5). Alternative 1 (No Action) would lead to further degradation of water quality and fish habitat as a result of road failures and road surface erosion (Section 3.2 and 3.5).

- Special Status and SEIS Special Attention Species and Habitat Objectives: Alternative 2, the proposed action, is predicted to not contribute to the need to list or elevate the status of any Special Status or Special Attention species to a higher level of concern (Chapter 3 and Appendix 2). Alternative 1 (No Action) could affect Special Status fish species and their habitats through increased sediment and turbidity resulting from road surface erosion and road failures (Section 3.5).

- Roads: Alternative 2 would upgrade culverts to meet at least a 100-year flood, and remove sidecast material with a high likelihood of failing and creating subsequent impacts on water quality and fish habitat (Chapter 3). Alternative 1 would lead to future impacts on water quality and fish habitat from road failures and surface erosion.

- Best Management Practices: Alternative 2, the proposed action, contains applicable Best Management Practices described in Appendix C of the RMP.

- Healthy Lands Standard: It has been determined that the Salem District RMP is consistent with the Standards and Guidelines for healthy lands at the land use planning scale and associated timelines. Since Alternative 2 is in conformance with the Salem District RMP as noted above, it is also consistent with the healthy lands standard.

Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl and Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl (April, 1994).

- The Salem District RMP is consistent with the Record of Decision and Standards and Guidelines, pp. B-31, B-32, C-32, C-33 *(Salem District Resource Management Plan/Final Environmental Impact Statement, September, 1994, Chapter 4-96).* Since the proposed actions are consistent with the RMP, this alternative is consistent with the Record of Decision and Standards and Guidelines.

Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines (January, 2001).

- The proposed action is consistent with the Record of Decision requirement to conduct surveys prior to issuing decisions for habitat-disturbing activities, and the requirement to follow survey protocols.

Northern Coast Range Adaptive Management Area Guide (January, 1997): The proposed actions are consistent with the management emphasis on conservation of fisheries habitat in the AMA Guide (pages 8, 14, 34, 50).

Late Successional Reserve Assessment for Oregon's Northern Coast Range Adaptive Management Area (January, 1998): The proposed actions are consistent with the management objective to "Manage road and trail systems consistent with Access and Travel Management/Transportation Management Objectives" (page 86) and the potentially appropriate management activities: close or stabilize roads; stabilize slopes; pull back sidecast on steep slopes (page 89).

Deer Creek, Panther Creek, Willamina Creek, and South Yamhill River Watershed Analysis (1998), and North Yamhill Watershed Analysis (1997).

- The *Deer Creek, Panther Creek, Willamina Creek, and South Yamhill Creek Watershed Analysis (1998)* supports the proposed activities. Recommendations contained on pages 74 - 84 were considered in the development of the proposed actions. Some of these recommendations are listed below.

Hydrology and Stream Channel - "Reduce existing soil compaction levels by obliterating roads that are not needed for future management and by treating old compacted areas such as dirt roads and cat trails with a winged subsoiler."

Water Quality - "Identify road-related sediment problems, such as older roads with inadequate or failing water crossing structures or failing sidecast. Evaluate the potential for sediment delivery from these sources to determine whether it is appropriate to fix the problems."

Roads - "There is a dense network of roads in T.3S., R.5W. S 19 and T.3S., R.6W. Sections 13, 19, 21, 22, 23, 26 that should be inventoried for candidates to obliterate."

- *North Yamhill Watershed Analysis (1997):* The proposed action is consistent with the recommendation to reduce sediment delivery from forest roads in the North Yamhill River watershed (pages 142-145).

Coastal Zone Management Act, as amended: The project area is not located within Oregon's Coastal Zone boundary.

Endangered Species Act: The proposed action is included in the *Programmatic Biological Assessment (BA) for On-going USDA Forest Service and USDI Bureau of Land Management Activities Affecting Upper Willamette Steelhead Trout and Upper Willamette Chinook Salmon within the Willamette Province (above Willamette Falls), Oregon*, which was submitted to National Marine Fisheries Service (NMFS) May 1999. Categories of actions within the BA that the proposed actions fall within include: Road Maintenance, Road Decommissioning and Obliteration. A Biological Opinion (BO) covering the actions described in the programmatic BA was received from NMFS on July 28, 1999, and an Incidental Take Statement (ITS) for the programmatic BO was issued on June 5, 2000 and expires on September 30, 2001. It is expected that future ITS's will be similar to the current programmatic for this type of activity. All design features of the proposed actions comply with the Terms and Conditions contained within the BO.

The proposed action will be included within the North Coast Province Programmatic Biological Assessment for Projects which would Disturb the Habitats of Bald Eagles, Northern Spotted Owls and Marbled Murrelets for those years in which road stabilization activities will occur. All design features of the proposed action comply with the terms and conditions contained within the 2001 BO.

Magnuson-Stevens Act: Consultation with NMFS for actions that "May Affect" EFH as described in the Magnuson-Stevens Act is required. Withing the Willamette Basin, all populations of coho and chinook salmon are included and require the incorporation of mitigation measures such as BMP's and the inclusion of NMFS conservation recommendations or written justification of why they would not be incorporated into project actions. All design features of the proposed action are anticipated to comply with the conservation recommendations contained within the BO for these programmatic actions, and any deviation will be noted in written response to NMFS for EFH.

4.0 List of Interdisciplinary Team Members, Preparers and Support Staff

Table 7. List of Interdisciplinary Team Members, Preparers and Support Staff

NAME	**TITLE**	**RESOURCE**
Bob McDonald	GIS Specialist	ID Team Leader, GIS Support
Steve Bahe	Wildlife Biologist	Wildlife
Gregg Kirkpatrick	Recreation Planner	Recreation
Andy Pampush	Ecologist	Survey and Manage
Kurt Heckeroth	Botanist	Botany
Tim Livengood	Engineering Technician	Engineering
Kent Mortensen	Forestry Technician	Silviculture
Katrina Symons	NEPA Coordinator	NEPA, Cultural Resources
Matt Walker	Fisheries Biologist	Fisheries
Dennis Worrel	Soil Scientist	Soils & Hydrology

5.0 CONSULTATION and PUBLIC INVOLVEMENT

See chapter 1.6 - Issues and Units of Measure for a discussion of the public involvement process and chapter 3.7 - Conformance With Land Use Plans, Policies, and Programs for a summary of ESA consultation with NMFS and USFWS.

Appendix 7 will contain the public comments, and BLM responses to those comments, received in response to the 30-day public comment period for this EA.

6.0 GLOSSARY

ACS - See Aquatic Conservation Strategy

Aquatic Conservation Strategy Objectives - The Aquatic Conservation Strategy (ACS) was developed to restore and maintain the ecological health of watersheds and aquatic ecosystems contained within them on public lands. The four components of the Aquatic Conservation Strategy (Riparian Reserves, Key Watersheds, Watershed Analysis, and Watershed Restoration) were developed to meet the nine ACS objectives. (See pages 5-7 of the Salem RMP for a listing of the ACS objectives, or Appendix 6 of this EA)

Environmental Analysis - A systematic process of developing reasonable alternatives and predicting the probable environmental consequences of a proposed action and the alternatives.

Environmental Impact Statement - A formal document to be filed with the Environmental Protection Agency that considers significant environmental impacts expected from implementation of a major federal action; a detailed written statement as required by section 102(2)(C) of the [National Environmental Policy] Act, as amended (40 CFR 1508.11).

Evolutionarily Significant Unit - A population that is reproductively isolated from other conspecific populations and represents an important component in the evolutionary legacy of the biological species.

Finding of No Significant Impact - A document by a Federal agency briefly presenting the reasons why an action, not otherwise excluded (40 CFR 1508.4), will not have a significant effect on the human environment and for which an environmental impact statement therefore will not be prepared (40 CFR 1508.13).

IDT - See "Interdisciplinary Team"

Interdisciplinary Team - A group of environmental experts specializing in a range of disciplines, who conduct the environmental analysis.

Major Issue - Also referred to as "significant issue." A major point of discussion, debate, or dispute about environmental effects of the proposed action. For the purposes of the National Environmental Policy Act, a major issue or significant issue is an issue within the scope of a proposed action, which is used to formulate alternatives, develop mitigation measures, or is important in tracking effects.

National Environmental Policy Act - The basic national charter for the protection of the environment. It establishes policy, sets goals (section 101), and provides means (Section 102) for carrying out the policy.

NEPA - See ANational Environmental Policy Act@

TMO - See Transportation Management Objective.
Transportation Management Objective - Specific management objectives considering multiple resource needs for both the sort- and long-term access needs for each road under BLM management.

Unit of Measure - A measure is an indicator of a variable; a yardstick to determine how the variable is moving (being changed or being altered) relative to an established base point and how the variable is being affected or the change occurring because of the proposed action/alternatives.

7.0 BIBLIOGRAPHY

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